

Patent Claims

1. A vacuum arc source including a target with a surface for operating an arc discharge, wherein the target is arranged in the effective area of a device producing a magnetic field characterized by the fact that the device producing the magnetic field is comprised of at least two magnet systems with opposite poles and is designed so that the component B_{\perp} of the magnetic field perpendicular to the surface has basically constant values smaller than 30 Gauss over the greater part of the surface or is zero.
2. The arc source in Claim 1, characterized by the fact that the value of the perpendicular magnetic field component B_{\perp} is smaller than 20 and preferably smaller than 10 Gauss.
3. The arc source in one of the preceding claims, characterized by the fact that the greater part of the surface extends from the middle of the target surface to the rim, and so that the greater part includes at least 50%, especially preferred 60% or more, of the geometrically determining mass or masses of the target surface.
4. The arc source in one of the preceding claims, characterized by the fact that on the rim of the target surface, the values $B_{\perp R}$ of the perpendicular magnetic field component rise, fall and/or change signs compared to the values $B_{\perp M}$ in the middle of the target surface.

17. A vacuum system in which at least one arc source is arranged according to one of Claims 1 to 16.
18. The system in Claim 17, characterized by the fact that the at least one arc source works in the direction of the axis of the system and has at least one other electromagnetic coil arranged concentrically to the axis of the system in order to deflect the plasma beam produced.
19. The system in Claim 18, characterized by the fact that the at least one other coil is connected to at least one time-altered current source with a control unit, in order to deflect the alignment of the plasma beam produced by the at least one arc source variably.
20. The system in one of Claims 18 to 19, characterized by the fact that at least two other electromagnetic coils, preferably in the upper and lower or corresponding areas laterally bordering the system are arranged concentrically to the axis of the system and have a different or the same diameter or a design basically corresponding to a Helmholtz coil arrangement.
21. A method of operating an arc discharge on the target surface of an arc source USING a device producing a magnetic field, characterized by the fact that a magnetic field is produced on the surface with the device for producing a magnetic field from at least two magnetic systems with opposite poles, so that its perpendicular component B_{\perp} runs over the greater part of the surface basically constantly near or at zero.

22. The method in Claim 21, characterized by the fact that the value B_{\perp} of the perpendicular magnetic field component is set to be smaller than 30, preferably smaller than 20 and more preferably smaller than 10 Gauss.
23. The method in one of Claims 21 to 22, characterized by the fact that the magnetic field is set so that the greater part of the surface with component B_{\perp} running basically constantly near or at zero extends from the middle of the target surface to the rim, so that the middle includes at least 50%, especially preferred 60% or more, of the geometrically determining mass or masses of the target surface.
24. The method in one of Claims 21 to 23, characterized by the fact that, the values $B_{\perp R}$ on the rim of the target surface of the perpendicular magnetic field components are set to rise, fall and/or change signs compared to the values $B_{\perp M}$ in the middle of the target surface.
25. The method in one of Claims 21 to 24, characterized by the fact that the value of the parallel magnetic field component B_{\parallel} is basically set at zero in the middle and in the direction of the rim of the target surface rises, preferably symmetrically in relation to the middle of the target, so that